

Timeframe to Meet Site Remediation Goals:

The EPA continues to be concerned that elevated levels of site contaminants still exist in areas of the Grenada site. Source control has been conducted at several SMWUs, and a site-wide groundwater remedy has been constructed to treat groundwater contamination originating at the main plan area. While some on-site monitoring wells are exhibiting a decline in contaminant concentrations since the construction of the PRB, other wells are showing little or no decline in contamination, raising the issue of the overall timeframe needed to reach site remediation goals and whether all source areas have been identified and addressed.

The EPA and Meritor have had numerous discussions about the performance of the site-wide groundwater remedy (PRB) at the Grenada site, and Meritor has taken steps to investigate additional areas of uncertainty to provide a better understanding of the groundwater contamination at the Grenada site (in the area of the PRB and in the MW-20 area). In addition, the groundwater monitoring program required comprehensive groundwater monitoring throughout the site in 2012. This comprehensive data set, combined with the updated site-wide flow model and the additional information obtained from the PRB and MW-20 areas, allows for the detailed evaluation of the overall effectiveness of the site-wide remedy and an estimate of the timeframe to reach site remediation goals. This type of presentation should be included in the 2012 annual monitoring report.

Specific Comments to be Addressed in the 2012 Supplemental Report

1. There are no snap shots of historical plume boundaries included in the report or analysis presented in earlier sections to support the summary statement in the 2nd bullet that the plume configuration and boundary has remained consistent with historical data with few exceptions.
2. The 5th bullet states that the long-term trend of contaminant concentrations in the post-closure monitoring wells at the Equalization Basin are showing gradual decline. While this may be partially true, it is important to note that the concentrations of TCE in all 5 wells are well above the MCL for TCE, with RT-2 and RT-3 exhibiting levels of TCE up to 2000 times the MCL (could this area be source of TCE in the off-site area near MW-20? Do we have information about the deeper portion of the aquifer in this area?). However, the long-term trends in VOC concentrations for all wells, including the Equalization Basin wells, will be evaluated in the supplement to the 2012 Annual Report. The statements made in this summary bullet are correct and no changes are needed for the revised 2011 Annual Report.

So really this boils down to a question regarding how long it will take to reach remedial goals at the site. It is assumed that remedial goals means MCLs. There are two approaches to this question. In the first, one could take the assumption that there is no remaining DNAPL present at the site and that the dissolved-phase must continue to be treated until it reached MCLs

entering the PRB and then the PRB can be abandoned (somehow). This would be considered a best-case scenario. To do this, the adsorption of the CVOCs to organic material in the aquifer must be considered to determine how many pore volumes of groundwater it would take to reach MCLs without further treatment. This is a fairly straight-forward calculation that involves a look at the aquifer as-if unimpacted water replaces the current impacted water. Use the highest concentration zone and determine how much of the sorbed contaminant is removed from the aquifer TOC with each influx of fresh water. Determine how many pore volumes are needed to reach MCLs and then determine the time period needed for a pore volume to flux through the system. Multiply the single flux time period by the number of pore volumes needed and you will get the time frame for best case.

Now you have to consider that there are significant on-site clay lenses (they probably contain NAPL, but don't assume this for now. We then need to look at diffusion rate from the clay (there is little or no advection out of the clay) and how this affects the number of pore volumes and time period. A model might help work through this scenario, but the bottom line will be that there is too much time for clean-up of this aquifer even if no NAPL is assumed to remain in any of the source areas.